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The Feeding of Farm Animals for Health and Production

LAST week's Conference, organised by the B.V.A. in association with the Animal Feeding Stuffs Trade, was the third of what might be called the "constructive conferences," successfully arranged by the Technical Development Committee under the Chairmanship of Mr. G. N. Gould. The coining of this expression is intended to suggest the manner in which these three conferences—grassland, metabolic disorders, and feeding for health and production—drew the profession's attention to those broader horizons with which practitioners are required to concern themselves in these days. The accent, on each occasion, was laid on the anticipation, and the prevention of disease, rather than upon the successful treatment of conditions after they have arisen. The scope of veterinary science is an ever widening one as the articles and reports published in this journal make abundantly clear, and the whole profession will, we believe, echo the words of their President in his opening address to this Conference, when he said: "In the animal health and productivity team the veterinary surgeon might accept the responsibility of co-ordinator, and, if need be, of leader. The place for veterinary science is in the stream of life and not on its banks."

Both in preventive medicine and in the treatment of disease conditions many sciences are called upon to play their part. The veterinary surgeon, who is the technician charged with the responsibility of seeing applied in practical form the findings of these sciences, is logically the keystone of the arch. Not only his individual clinical skill, but the breadth of his mind and his willing acceptance of new ideas and techniques are indispensable to the successful discharge of his obligation both to his patients and his clients.

There is another important gain from last week's conference: what might be called a diplomatic gain. The introduction of antibiotics into the food of young animals has presumably come to stay, and in this connection readers will be particularly interested in the article, published on another page, which describes the effect of supplementing the diet of foals with aureomycin hydrochloride. But the possibility should not be overlooked that dietary supplements may pave the way for supplementing animal feeding stuffs at therapeutic levels. Should such a practice be attempted it will be of vital concern to veterinary surgeons. How advantageous, then, for the Association to have met, and deliberated in harmony with the animal feeding stuffs trade, and to

(Continued at foot of col. 2, page 751)

The Effect of Supplementing the Diet of Thoroughbred Foals with Aureomycin Hydrochloride

BY

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and
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Director of the National Stud

THE use of antibiotic feeding supplements is now becoming an established practice in several species of animals, and a great deal of work has been undertaken both to establish the mode of action and to explore the practical application of these supplements. (Braude, Kon & Porter, 1953 ; Jukes & Williams, 1953 ; Stockstad, 1954).

It is now generally recognised (Gordon & Taylor, 1954) that many species, including man, may show a growth response with a diet containing an antibiotic supplement, but so far little attention has been devoted to the response in the thoroughbred horse. The purpose of this paper is to report a preliminary investigation into the effect of an aureomycin supplement on the development of thoroughbred foals.

Materials and Methods

Twelve thoroughbred in-foal mares were collected from various sources and foaled, over a period of three months, at the National Stud. The foals were randomised into two groups by alternate allocation in order of birth. One group received aureomycin and the other acted as controls. Aureomycin was fed twice daily from birth to nine months of age, and the period of experimental observation was continuous from birth to 18 months of age. The plan of the experiment is shown in Table I.

TABLE I
PLAN OF EXPERIMENT

Foal Number	Sex	Date of Birth	Weight at Birth (lb.)*	Treatment	Remarks
1	M	24.3.53	114	Control	
2	M	31.3.53	143	Aureomycin	
3	F	3.4.53	127	Control	
4	M	4.4.53	128	Aureomycin	
5	M	13.4.53	119	Control	
6	M	15.4.53	101	Aureomycin	
7	M	16.4.53	114	Control	
8	M	26.4.53	97	Aureomycin	
9	F	1.5.53	109	Control	Removed from experiment
10	M	13.5.53	131	Aureomycin	
11	F	21.5.53	104	Control	
12	M	30.5.53	124	Aureomycin	

*Mean weight of control group 115·6 lb.
Mean weight of aureomycin-fed group 120·7 lb.

Husbandry

The foals were born during March, April and May, 1953, and were allowed to run with their dams for five months. During this time the dams were kept on the same pasture and were fed a uniform ration of oats and bran. Throughout this period the foals had access to their dams' ration.

At five months of age the foals were weaned and were individually fed twice daily receiving oats in the morning and an oat and bran mash in the evening. In addition, a supplement of linseed oil and cod liver oil was fed to each foal twice weekly.

Normal precautions against worms were taken, the droppings being removed from the pastures daily. By arrangement between the National Stud and the Equine Research Station of the Animal Health Trust the faeces of each animal, at the time of weaning, were examined for ascaride and strongyle eggs followed by anthelmintic treatment and a further examination of the faeces.

Administration of Aureomycin Hydrochloride

Aureomycin hydrochloride was administered at the rate of 100 mg. per day from birth to three months of age and 200 mg. per day from three to nine months of age. The dose was divided into two equal portions and administered twice daily at the time of feeding. Immediately before administration each dose was mixed with half an ounce of honey and was then applied as an electuary. The weight and potency of individual doses was checked periodically.

Records

Each foal was weighed within 24 hours of birth and thereafter every seven days for 18 months. The weight of food fed to each foal from the time of weaning was recorded weekly.

In order to detect any differences in bone formation, a radiograph was taken of the left metacarpus and fetlock joint of each of the foals at three, six and nine months of age. The conditions under which the radiographs were taken were standardised on each occasion to provide a series of comparable pictures.

Faeces samples and blood samples were taken every six weeks from each foal at varying times after feeding to measure the concentration of aureomycin detectable. The method of assay employed was based on the "cup-plate" method described by Heatley (1949). The test organism used in the present work was *B. cereus*. This routine also served as an additional check on the correct administration of the aureomycin supplement. Following the detection of aureomycin in the faeces of foal No. 9 in the control group it was discovered that this foal had inadvertently received a dose of aureomycin and it was removed from the experiment.

From the above records the following information was obtained in the two groups.

1. Rate of growth.
2. Food consumption.
3. Bone development.
4. Aureomycin levels in blood and faeces.

Results

1. **Rate of Growth.** This was measured by the three standard methods described by Brody (1948).

(*a*) *Absolute Growth Rate.* The mean daily liveweight gain measured in lbs. This measure provides a figure for the mean daily gain, without expressing any variation in growth rate occurring during the period under study. It can be seen from Table II that the increase in the growth rate of the aureomycin-fed group over the control group at weaning was 14·1 per cent., whereas at the end of aureomycin treatment it was 10·5 per cent., and at the end of the experiment it was 7·0 per cent. The standard deviation of the aureomycin-fed group was smaller than that of the control group during the period of supplementation, but was greater thereafter. The differences in growth rate at the time of weaning and at the end of aureomycin treatment were significant ($p < 0.01$), whereas with the small number of animals employed, neither the overall growth increase at the end of the experiment nor the fall in growth rate following removal of the aureomycin was significant.

(*b*) *Relative Growth Rate.* (Minot's Growth Rate). This is a measure of the weight gain when related to the birth weight. It is expressed as the weight gain during a given time divided by the weight of the animal at the beginning of that time interval. With the figures under examination this method takes into account the variation in the mean birth weights of the two groups as shown in Table 1. It can be seen from Table III that as with the absolute growth rate the aureomycin-fed group show an increase in growth rate over the control group at weaning, at the end of aureomycin treatment and at the termination of the experiment. This difference is greatest before weaning.

(*c*) *Instantaneous Growth Rate.* This is a method of showing the true rate of growth of the two groups at any particular time, rather than the average rate over a period of time. Fig. 1 *(overleaf)* shows the mean weight of the two groups plotted against time, from which it can be seen that the difference between the two groups increased when the dose of aureomycin was increased, and the rate of growth of both groups was reduced at weaning and at the end of aureomycin treatment.

Fig. 2 shows the actual weekly growth rates (lb. per day) plotted against age. In view of the small numbers of animals in each group the results were plotted as the moving average of six separate weekly figures. This figure shows the decline in growth rate of both groups with increasing age and the instantaneous growth rate of both groups throughout the experiment. When this figure is compared with Fig. 3 it can be seen that the time of the greatest growth rate is not the time of the greatest growth increase over the control group. Fig. 3 also shows there to be no growth increase after the 32nd week, and an actual decrease in growth rate of the aureomycin-fed group after the removal of the aureomycin.

TABLE II
ABSOLUTE GROWTH RATES *

Age of Foals	Control Group		Aureomycin-Fed Group		Increase of treated over control group
	Mean Growth Rate	Standard Deviation	Mean Growth Rate	Standard Deviation	
					per cent.
21 weeks (Weaning)	2·48	±0·22	2·83	±0·19	14·1
39 weeks (Discontinuation of Aureomycin)	1·90	±0·10	2·10	±0·07	10·5
56 weeks (Termination of Experiment)	1·71	±0·10	1·83	±0·19	7·0

* Absolute Growth Rate $= \frac{W_2 - W_1}{t_2 - t_1}$ When W_2 = Weight at end of period; W_1 = Weight at beginning of period; t_2 = Time at end of period; t_1 = Time at beginning of period

TABLE III
RELATIVE GROWTH RATES*

Age of Foals	Mean Relative Growth Rates of:		Increase of treated over control group
	Control Group	Aureomycin-fed Group	
			per cent
21 weeks (Weaning)	19·68	25·60	30·1
39 weeks (Discontinuation of Aureomycin)	26·32	33·37	26·8
56 weeks (Termination of Experiment)	58·06	59·59	2·6

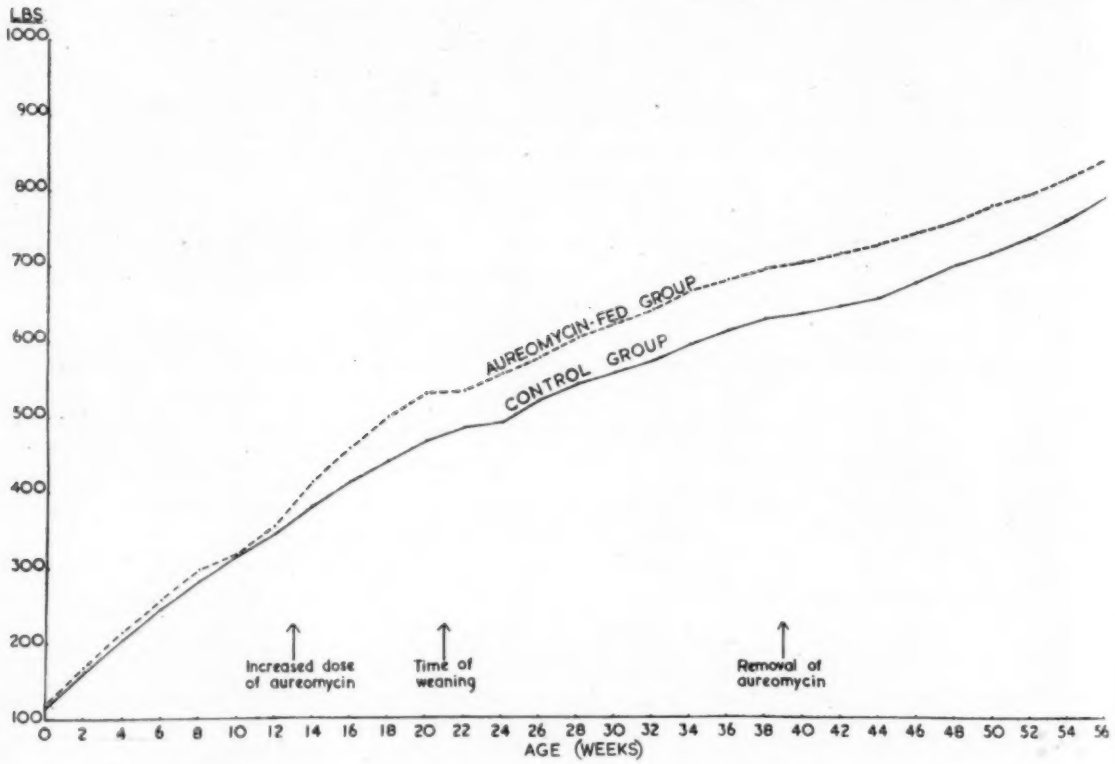
* Relative Growth Rate $= \frac{W_2 - W_1}{W_1}$

When W_1 = weight at birth

W_2 = weight at end of period

FIG. 1.

COMPARISON OF THE MEAN GROWTH CURVES OF TREATED AND CONTROL GROUPS OF FOALS



2. **Food Consumption.** The mean weight of concentrates eaten per foal from weaning to the end of aureomycin treatment was 1·8 lb. per lb. liveweight gain in both groups and from weaning to the end of the experiment, it was 3·4 lb. in the control group and 3·3 lb. in the aureomycin-fed group. It was not possible to measure the intake of the dam's milk, hay or grass.

3. **Bone Development.** No differences were seen in the density of the metacarpal bones or the degree of union of the epiphyses with the shaft which could be attributed to the experimental treatment. Unification of the epiphyses occurred between the 20th and 32nd week irrespective of treatment.

4. **Aureomycin levels in Blood and Faeces.** Blood levels were detectable on most occasions between one and four hours after administration of the aureomycin. The amounts detectable were very low, being of the order of 0·018 to 0·05 μg. per ml. of serum.

Aureomycin was present in the faeces continually throughout the period of treatment. During the first 12 weeks of life the concentrations of aureomycin detectable were relatively high, varying from 0·03 to 4·0 μg. per gramme of faeces whereas for the remainder of the experiment they were of the order of 0·03 to 0·1 μg. per gramme.

Discussion

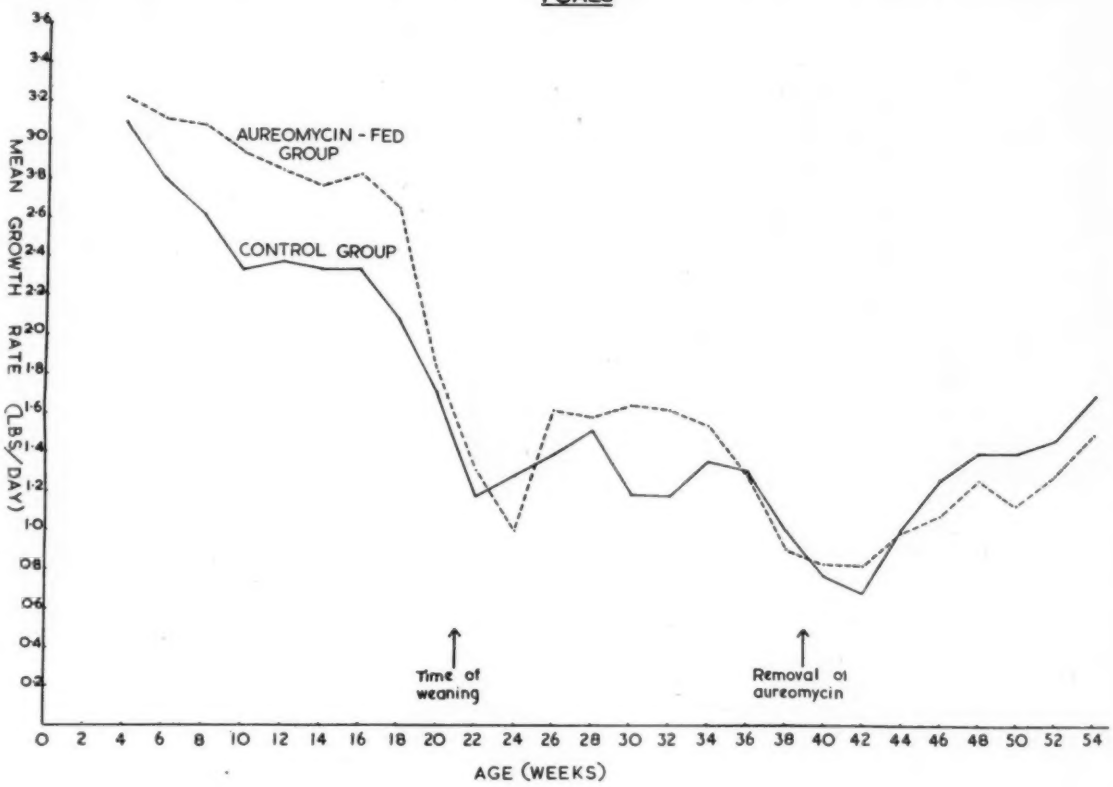
There is surprisingly little published work on the normal growth rate of the thoroughbred horse with which our figures can be compared. Berthelon (1953) measured the effect of a dietary supplement which included penicillin and aureomycin using the height of the animals as the factor for comparison. Using animals of six to eight months of age he obtained no benefit, which is perhaps not surprising when judged by our present results.

Although an increase in growth rate has been established in the young animal, it has yet to be shown whether this benefit will be reflected by an improved performance at maturity. The effect of withdrawing the supplement also requires further investigation for in the present work the small number of animals available precluded the use of a further group of aureomycin-fed animals kept on the supplement throughout the whole experiment.

The mode of action of such supplements in increasing growth is a question receiving considerable attention at this Station and the finding of aureomycin in the blood and faeces of the supplemented animals is supported by similar findings in other species. It is becoming increasingly clear that at least part of the benefit

FIG. 2.

COMPARISON OF INSTANTANEOUS GROWTH RATES OF TREATED AND CONTROL GROUPS OF FOALS



is due to the removal of a growth inhibiting effect associated with the microbiological flora of the animal.

It is reasonable to suppose that a frequently detectable blood level and a continuously detectable gut level of a stable broad spectrum antibiotic such as aureomycin (chlortetracycline) will do much to deter the establishment of certain clinical and sub-clinical infections.

Summary

A supplement of 50 to 100 mg. of aureomycin hydrochloride was administered twice daily to a controlled group of six thoroughbred foals for the first nine months of life. Under the conditions described :

1. During the period of supplementation a significant increase in growth rate occurred.

2. Following the removal of the aureomycin supplement a fall in growth rate occurred which was not significant.

3. There was no improvement in the utilisation of food as measured by the intake of corn.

4. There was no alteration in bone development discernible by X-ray examination.

5. Detectable aureomycin blood levels were established up to four hours after feeding and aureomycin was detectable in the faeces throughout the entire period of supplementation.

Acknowledgments. We wish to thank Mr. J. A. Pasfield, Veterinary Surgeon, of Horsham, and Col. T. S. Green, Veterinary Surgeon, of Shaftesbury, for the blood samples, Professor C. Formston for providing the X-ray facilities, Dr. P. Cave for examining the radiographs and Lederle Laboratories for providing some of the aureomycin used in these trials.

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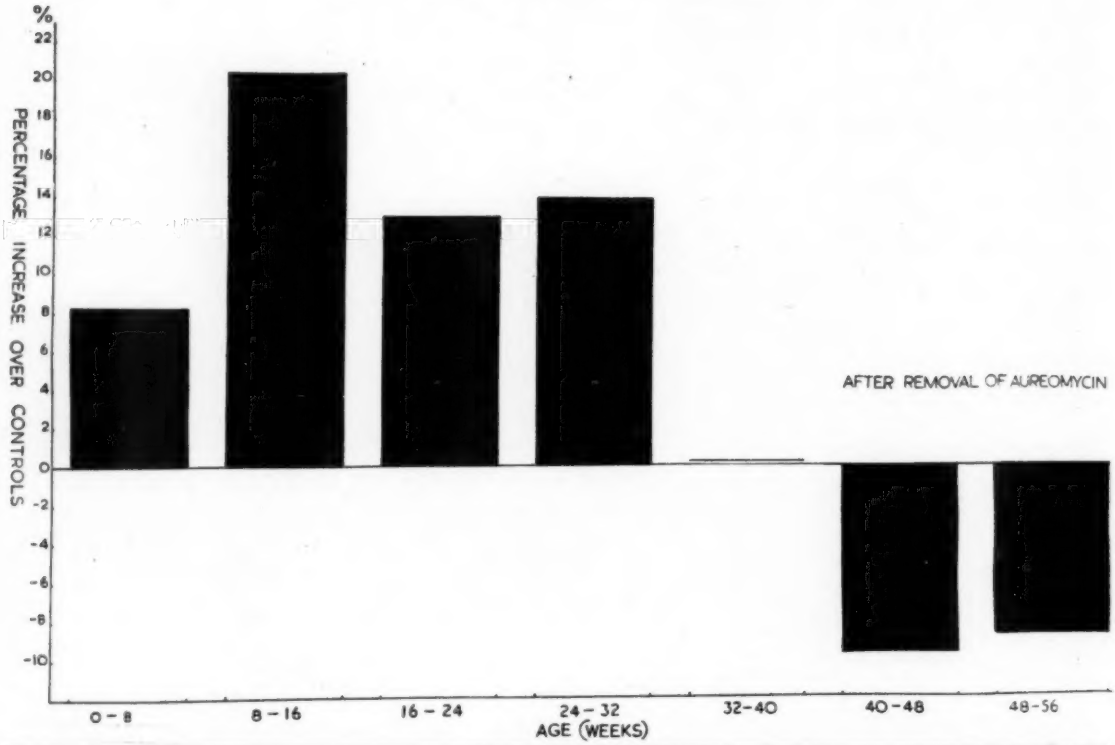
(Fig. 3 appears overleaf)

FIG. 3.

THE RELATIONSHIP BETWEEN THE AGE OF FOALS AND THE PERCENTAGE GROWTH INCREASE WHEN FEEDING AUREOMYCIN



CONFERENCE ON NUTRITION

To round off the preliminary account, published last week, of the conference, "The Feeding of Farm Animals for Health and Production," a note on the closing ceremony may be recorded. After the conference papers and discussions had been most ably summed up by Dr. D. P. Cuthbertson, Director of the Rowett Research Institute, Aberdeen, Professor Robertson said:—

In my opening remarks, Ladies and Gentlemen, I stressed the fact that we were all—veterinarian and non-veterinarian, laboratory worker and field worker, scientist and practical man of affairs—we were all participators in the great task of increasing and spreading knowledge of animal nutrition and of getting it applied in the field of Agriculture. That, I indicated, required team work if our efforts were to be fully effective, and I hinted that the veterinary surgeon might well be utilised as co-ordinator and, if need be, as leader of the team.

I feel it is appropriate, therefore, at this stage to put on record my appreciation of the fact that this, our first major attempt at a co-operative effort in that direction, should have been such an overwhelming success—far greater, I am sure, than any of us dared hope. That success is due in no small measure to the way in which everyone concerned responded not only willingly but eagerly to my Association's lead and gave of their best.

I would like, in particular, to express my own personal thanks to the two Presidents, Mr. Silcock and Mr. Fulford, who came in person to support me and to grace the occasion. I must apologise to them for having monopolised the stage but doubtless the organisers felt that I had more experience of keeping veterinary surgeons in hand! Be that as it may, I do just wish to say how much I have appreciated the moral support they have given me; and I would add that if such willing, friendly and unobtrusive help is to be the keynote of our relationship with the Feeding Stuffs Trade it augurs well for the success of future collaborative efforts between our Associations in the years to come.

Mr. A. J. Wright then proposed a vote of thanks to the readers of papers and the openers of discussions. He said a very high standard had been maintained throughout both days, and he, speaking for the profession, wished to express the debt owed to their non-veterinary colleagues for their valuable collaboration. The vote of thanks was seconded on the Trade's behalf by Colonel C. A. Brooks.

Mr. A. Thomson, Senior Vice-President of the B.V.A., expressed thanks to the organisers of the conference, to members of the liaison committee between the B.V.A. and the Trade, to Mr. Gould and Dr. Cuthbertson, and, not least, to Professor Robertson for his genial and effective chairmanship.

Ascaris lumbricoides as a Cause of Pneumonia in Pigs

BY

A. O. BETTS

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THERE is still a widely-held belief among veterinary surgeons and farmers that the larvae of *Ascaris lumbricoides*, during their migration through the lungs, produce pneumonia in the antero-inferior parts of the organ, associated with coughing and unthriftiness. The name "ascaris pneumonia" has been applied to the condition. Many observers who believe that the condition exists also believe that practically all pigs harbour *A. lumbricoides* and consequently in the past it has been assumed that the common coughing-pneumonia syndrome in pigs is the result of infection with these helminths.

The symptoms and lesions ascribed to "ascaris pneumonia" are closely similar to those caused by virus pneumonia. It seemed important, therefore, firstly to investigate whether, in fact, infection with *A. lumbricoides* could cause pneumonia of this type, and secondly to obtain some idea of the actual incidence of Ascaris infection at the present time.

Materials and Methods

For the examination of faeces samples from the field, well-mixed specimens were taken and nematode eggs were counted by the slightly modified McMaster technique used in this Department for routine faecal egg counts. A sufficient number of samples was taken from each farm to ensure that faeces from pigs of all ages on the farm were included.

Most of the Ascaris eggs from which the infective larvae were derived were obtained directly from the uteri of ascarids collected at a local bacon factory. The uteri were removed and the eggs expressed from them. The eggs were left at about 25° C. for three weeks to allow embryonation to occur, and then for a further five weeks for the larvae to become fully infective. Before the eggs were given to swine their infectivity was proved by administering them to guinea-pigs.

Eggs containing infective larvae were administered to pigs by mouth in gelatin capsules using a "Holborn" pig-gag and a pair of bowel forceps.

Results

(*a*) Field Observations

Early in the work on virus pneumonia at this laboratory, it was noticed during visits to local bacon factories that the incidence of *A. lumbricoides* in pigs was far lower than popular belief suggested that it should be. Furthermore, the incidence bore no relation to the presence or absence of pneumonia.

Following these observations an attempt was made to obtain more information about the incidence of Ascaris infection in the area around Cambridge. Accordingly, incidental to another survey in progress at the time, composite samples of faeces from 18 herds were collected and examined for the presence of nematode eggs with the results shown in Table I. Pigs in these herds were coughing and showed various degrees of unthriftiness.

TABLE I

Number of herds examined	Number of composite faeces samples	Ascaris eggs present		Oesophagostomum eggs present	
		Herds	Samples	Herds	Samples
18	90	3	5	18	49

Eggs of *A. lumbricoides* were found in faeces samples from only three herds and then very few eggs were present. In almost all the herds in the survey, pigs were regularly treated for roundworms at weaning time with sodium fluoride or oil of chenopodium, but only in the three herds in which the eggs of *A. lumbricoides* were detected did this result in worms being passed out with the faeces. The clinical and epidemiological picture presented by pigs in these three herds was typical of virus pneumonia. It was possible to examine at slaughter the lungs of pigs from two of these three herds. Only lesions identical with those of virus pneumonia were found. There were no haemorrhages of the type caused by the migration through the lungs of the larvae of *A. lumbricoides*.

(*b*) Experimental Investigations

A group of virus pneumonia-free pigs was infected with larvae of *A. lumbricoides* to see whether pneumonia could be so produced. Massive doses were administered in order to produce the maximum effect.

Larvae obtained by the techniques described above from the uteri of the total number of ascarids found in about 400 pigs killed for bacon, were given in capsules to six 11-week-old pigs as shown in Table II. Before

TABLE II

Pigs	Dose of larvae given	Days between dosing and killing
IB5	500,000	5
IB4	375,000	7
Co.1 and Co.2	250,000	10
IB2 and IB3...	250,000	21

administration to pigs the infectivity of the larvae in these eggs was proved by the administration of some of the eggs to three guinea-pigs. These guinea-pigs were killed seven days after the administration of the eggs, and the lungs of each were found to contain a mass of punctate haemorrhages, indicating that heavy migration of the larvae had occurred.

In all the pigs the temperature rose sharply between the fourth and sixth days and it remained elevated for a few days. Three of the pigs developed on the seventh day a soft, moist cough very different from the harsh cough caused by virus pneumonia. This cough persisted for, at most, five days and disappeared as the temperature returned to normal. After this the pigs appeared clinically normal and thrived well. The temperature chart of IB3 is shown in Fig. 1.

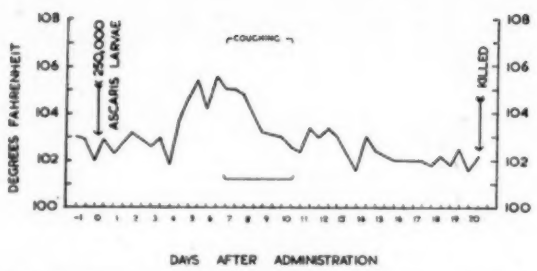

Fig. 1.—The temperature chart of pig IB3 which was dosed with 250,000 Ascaris larvae.

At autopsy, five days after infection, the lungs of one of the pigs (IB5) had punctate haemorrhages with small surrounding areas of consolidation throughout the lung substance ; but there was no evidence of pneumonia in any way resembling that of virus pneumonia. The main site of damage, moreover, was not in the lungs, but in the liver of this pig, which showed generalised reticulate fibrosis, a few " milk spots " and many small haemorrhages.

A similar pathological picture was presented by the pig killed on the seventh day. The lesions found are illustrated in the photographs of the lungs and liver of this pig which are shown in Figs. 2 and 3. From the lungs of this pig Ascaris larvae were recovered. Recovery of larvae from the lungs of the other pigs was not attempted.

Similar, but less severe damage was seen in the lungs of the pigs slaughtered 10 days after infection and the lesions appeared to be healing. The livers, however, were still severely affected.

Twenty-one days after infection, the time at which pigs are normally killed for the observation of the lesions of virus pneumonia, the lungs of the two remaining pigs were macroscopically normal, neither haemorrhages nor pneumonia being visible. The livers, however, were grossly cirrhotic, but again although " milk spots " were present, a striking feature was the amount of reticulate fibrosis which had occurred. This fibrosis was confirmed in all cases by histological examination.

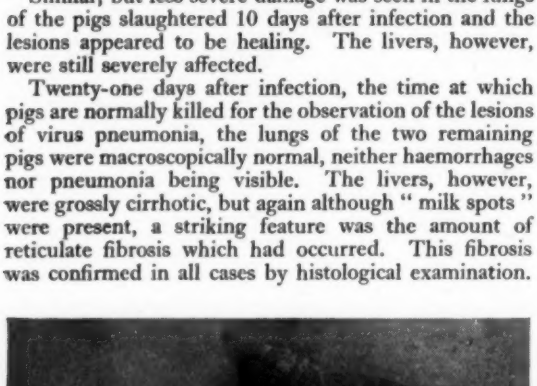

Fig. 2.—The lungs of pig IB4 killed seven days after being dosed with 375,000 Ascaris larvae.

Discussion

These limited experiments show that, under the conditions investigated, although Ascaris larvae caused haemorrhagic exudation and consolidation of relatively small areas of the lung, they neither produced lobar pneumonia nor persistent coughing, although the massive doses used were far greater than those which could normally be ingested at one time under natural conditions. It can be argued that the continual administration of small doses of Ascaris larvae might have produced lobar pneumonia. This possibility was not investigated experimentally, but for at least two years a low-grade infection with *A. lumbricoides* has been present in one unit of virus pneumonia-free stock at this Department. Nevertheless, no pneumonic lesions in the lungs of pigs from this unit have ever been noticed at autopsy, nor have these pigs been heard to cough.

Fig 3.—The liver of pig IB4.

It is interesting to note that the survey, although small, indicates that, in East Anglia at least, there is not merely an incidence of Ascaris infection much lower than generally believed but also very widespread infection with Oesophagostomum, a species thought by some observers to be comparatively uncommon in pigs in Britain. This state of affairs may have been caused by the almost universal use of anthelmintics which have a selective action upon *A. lumbricoides*, but no effect upon Oesophagostomum. There is an analogy in sheep, in which species the widespread use of phenothiazine has markedly changed the composition of the parasitic burden by reducing greatly the incidence of phenothiazine-sensitive strongyles, thus allowing the Nematodirus species, which are more resistant to phenothiazine, to multiply.

Summary

Although it is popularly believed that the migrating larvae of *Ascaris lumbricoides* are responsible for the pneumonia of the dependent parts of the lungs commonly observed in pigs, and the persistent coughing associated with it, evidence of the presence of *A. lumbricoides* was found only in three of 18 herds showing

(Contd. at foot of col. 1 overleaf)

Comparison of the Ring, Plate and Whey Tests for Brucellosis, Using Milk from Cattle of Proven Brucella Status

BY

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A. McDIARMID

Agricultural Research Council, Field Station, Compton

SINCE the ring test was first introduced by Fleischhauer in 1937, this method has received increasing attention for detecting brucellosis and is now frequently used as an initial screening test in dairy herds, especially in the Scandinavian countries and the U.S.A. Much of the information pertaining to the efficiency of this test has, however, been based on field investigations, generally with bulk milk samples. These investigations, rarely adequately controlled, have in many instances been carried out under difficult conditions, often with few animals or with animals whose previous histories were not entirely known. More recently the ring and plate tests have been compared in greater detail by Blake, Manthei & Goode (1952) who stressed the usefulness of the plate technique and its ease of application. Both these methods depend essentially on the presence of agglutinins for brucella in the milk and it is important to ascertain whether the agglutinin response produced by Strain 19 vaccine is likely to mask, or be interpreted as that due to true infection. In the present state of our knowledge, certain questions appeared worthy of further investigation :—

(*a*) Does vaccination with Strain 19 before breeding age produce agglutinins subsequently detectable in the milk by these tests ?

(*b*) What is the significance and degree of correlation between the ring, plate and whey tests when carried out on material from experimental animals whose brucella status is known ?

(*c*) How do these results compare with those of the biological test on milk and what is the reliability of the latter test ?

Preliminary work had been commenced at Compton with antigens supplied by Weybridge in a group of cattle, some of which had been vaccinated with Strain 19 vaccine and others, acting as controls, which had not been vaccinated. All were kept in isolation and at succeeding pregnancies a number of vaccinated and control cattle were withdrawn from the main groups and exposed to infection with a virulent strain of *Brucella abortus*. Work on the ring test was also in progress at Weybridge and since the cattle at Compton were being subjected to regular blood agglutination tests and detailed cultural and biological examinations of their

Ascaris lumbricoides as a Cause of Pneumonia in Pigs—(Concluded).

this clinical and pathological syndrome. At bacon factories the incidence of adult Ascaris in the intestines of pigs was found to be low, and the presence of these nematodes appeared to bear no relation to the presence or absence of pneumonia in the host harbouring them.

To investigate whether, in fact, *A. lumbricoides* could cause pneumonia of the type popularly attributed to it, six pigs, known to be free from virus pneumonia, were each given 250,000 to 500,000 infective embryonated Ascaris eggs. The full amount was administered to each pig in a single dose. The clinical symptoms which followed infection were very different from those popularly ascribed to the natural condition. The pigs were killed at various intervals of time after dosing and although haemorrhages were abundant throughout the lung substance of the pigs killed on the 5th, 7th and 10th days, there was no sign of lobar pneumonia. The lungs of the two pigs killed 21 days after infection were macroscopically normal. In all six pigs the main site of damage was in the liver.

These results, therefore, support the view that many of the cases diagnosed in the field as " ascaris pneumonia " are, in fact, infections with virus pneumonia.

Acknowledgments.—I am indebted to Dr. G. Lapage, of this Department, for his advice and help and to Messrs. D. W. Muncey and P. T. Edwards for technical assistance.

S. WALES DIVISION DINNER-DANCE

The South Wales Division held their Annual Dinner-Dance at the Seabank Hotel, Porthcawl, on October 22nd. A gathering of 160 enjoyed a most successful evening The President of the Division, Mr. D. K. Bryson, proposed the loyal toast and also the toast of the B.V.A., to which Mr. Alex. Thomson, Senior Vice-President of the Association, responded. The Guests were proposed by Mr. L. E. Hughes, and Mr. R. D. Owen, F.R.C.S., President of the South Wales Branch of the B.M.A., responded. Mr. A. G. Beynon was toastmaster, and with Messrs. A. T. Morgan and F. V. John, also acted as M.C. for the dancing which followed dinner.

Leading Article (concluded)

continue such meetings—as is intended—both at local level and through a liaison committee under the Chairmanship of an ex-President, Mr. A. J. Wright.

On the conference itself it is not necessary to dwell in detail, though a further note is published on page 748. We hope it will not be long before the booklet giving the papers and discussions in full will be published, and it may be predicted with confidence that it will form an important addition to the " working armoury " of every member of the Association.

cyetic products, it was decided to undertake further work conjointly, the various milk tests concerned in this paper being carried out at Weybridge. Work is still in progress, but because of the widespread interest recently shown in the ring test, it seems advisable to publish a preliminary report on the results so far obtained with individual samples from the above groups of cattle in their first and second lactations.

General Experimental Procedure

Animals from which Samples were Obtained

These consisted of Ayrshire and Ayrshire × cattle reared, since calfhood, in a brucellosis-free environment in specially designed isolation buildings at Compton. In 1949, they were allocated to various groups arranged for the purpose of comparing the degree and duration of immunity afforded by Strain 19 vaccine to a challenge dose of 150,000,000 *Br. abortus* Strain 544—a long-term experiment which is not due to terminate until 1956. The vaccination procedure varied for each group and the general plan of the main experiment is shown in Table I. It will be observed from this plan that cattle of varying status were available for examination at successive pregnancies by standardised methods. Because of the well-known unsatisfactory results encountered with colostrum, no tests with this substance are included. The individual animals were tested at weekly intervals for 10 weeks after calving. Samples were obtained during the first and second lactations from cattle challenged and not challenged, in each of the vaccinated groups and from non-vaccinated controls.

The Method of Conducting the Tests and their Interpretation

Collection of Milk Samples

Composite milk samples were collected from the milking bucket of each cow at the afternoon milking. These were placed in McCartney bottles containing 2·0 ml. of 1 : 1,000 merthiolate as a preservative, taken to Weybridge, stored at 4° C. overnight and tested next morning, a biological test also being made. Similar samples without preservative were used for biological examination at Compton at the fifth and tenth weeks.

The Ring Test

One drop (0·03 ml.) of haematoxylin-stained antigen prepared at Weybridge was added to 1·0 ml. of milk in a narrow test tube and the contents mixed gently by inverting the tubes several times. The size of the tubes was such as to contain 1·0 ml. of milk in a column 2 cm. high. Incubation was at 37·5° C. in a water bath for 30 minutes and the results read as follows :—

Considered positive	+++	distinct blue cream ring—white milk column.
	++	distinct blue cream ring—slightly blue milk column.
	+	distinct blue cream ring—distinct blue milk column.
Considered negative	±	cream layer only slightly bluer than or of the same colour as the milk column.
	—	white or slightly blue cream layer—blue milk column.

In addition, in those cases in which a positive ring test was obtained with undiluted milk, the titre was determined by two-fold dilution of the positive milk with a known negative milk. The negative milk used for dilution was always obtained from the same brucella-free animals. In these tests the lowest dilution was 1 : 10 and, in contrast to the tests with whole milk, a " ± " result was taken as the end point.

TABLE I

EXPERIMENT TO COMPARE THE DEGREE AND DURATION OF IMMUNITY IN CATTLE FOLLOWING SINGLE AND MULTIPLE VACCINATION WITH S.19

Groups	Age at vaccination	Numbers of cattle to be tested at each pregnancy							
		1st	2nd	3rd	4th	5th	6th	Spares	Total
1	6 months	10	10	20	20	20	20	5	105
2	18 months	10	10	20	20	20	20	5	105
3	6 and 12 months	10	10	10	20	20	20	15	105
4	6, 12 and 18 months	10	10	10	20	20	20	15	105
5	*Controls*								
	Fellows to those in groups 1 to 4...	5	5	10	10	10	10	7	57
	Compton cattle	5	5	10	10	10	10	7	57
									534

The Plate Test

This was performed according to the method described by Blake, Manthei & Goode (*loc. cit.*) and was briefly as follows :—

0·08 ml. of milk was placed on a glass plate and mixed at room temperature with 0·03 ml. of ring test antigen prepared as for the previous test ; readings were taken 12 minutes later according to the following interpretation :—

++++,	*i.e.*, easily detected agglutination (approximately 100 per cent.).
+++,	*i.e.*, easily detected agglutination (approximately 75 per cent.).
++,	*i.e.*, easily detected agglutination (approximately 50 per cent.).
+,	*i.e.*, very slight agglutination (up to 25 per cent.).

Whey Agglutination Test

Milk samples were centrifuged at 1,000 r.p.m. for 15 minutes to separate the cream. The remainder of the milk was poured into a test tube and three drops

of rennet added to every 10 ml. Agglutination tests were prepared with the whey in the same manner as with blood serum, the antigen used being the same as for the standard blood test in Great Britain.* Titres of 1 : 10 or over were considered indicative of probable infection.

Biological Examination of Milk

One ml. of a mixture of gravity cream and sediment was inoculated intra-muscularly into each of two guinea-pigs. The guinea-pigs were killed at six weeks, a blood agglutination titre of 1 : 10 or over and/or culture from the spleen being regarded as evidence of the presence o infection.

Results

Since a large number of cattle in various groups were tested at weekly intervals for 10 weeks after parturition, a considerable number of individual records accumulated and it is not considered necessary to publish all these in detail. The total numbers of tests made by each method are summarised in Table II and these have been arranged further according to the various categories of animals examined. It will be observed from this table that no positives were detected in normal control cattle by any of the three methods, provided that a "±" ring test reaction is accepted as negative. On the other hand, in the infected control group only a small proportion of the tests were completely negative, the plate method giving the lowest figure ; of the milks which gave positive ring tests, over 60 per cent. were also positive after dilution, some having titres as high as 1 : 2,560 but these could vary, one tube either way, from week to week, occasionally dropping to nil (0·6 per cent.). No titres were seen in milks from vaccinated animals which had not been subsequently challenged. Numerous biological examinations were made with milk taken from the group which was proved to be infected at parturition and 66·9 per cent. of these samples gave a negative result by this method. There was apparently little interference with the results of the various milk tests by vaccination with Strain 19 before breeding age—six positive results being obtained from 1,098 samples examined by the ring test technique and three positives by the plate method in the same number of tests. Two positive whey tests were recorded in a total of 78 tests. Again, in those animals vaccinated and subsequently challenged by infection with *Br. abortus*, a difference could readily be demonstrated between the groups resistant to virulent *Br. abortus* and those in which immunity was not sufficient to enable the animals to withstand the experimental infection.

Discussion

By the adoption in this country 10 years ago, of a wide-scale vaccination programme with Strain 19 vaccine, the incidence of brucellosis in cattle has now been sufficiently reduced to encourage us to contemplate the possibility of the eventual eradication of this disease. Consideration has therefore to be given to the method or methods by which this could finally be accomplished. It appears that calfhood vaccination with Strain 19 together with an examination of milk for the presence of agglutinins is likely to yield the best results but whatever technique is used for the examination of milk, it must be easy to apply and accurate in so far as accuracy is possible with a test of this kind. Our results suggest that the plate test is easier to apply and more accurate than the ordinary whey agglutination and ring tests. The effect of vaccination with Strain 19 in different

TABLE II

SUMMARY OF RESULTS OF TOTAL TESTS MADE BY EACH METHOD WITH SAMPLES FROM THE DIFFERENT GROUPS

Method of testing milk	Samples from normal cattle	Samples from controls infected with *Br. abortus* Strain 544	Samples from groups vaccinated with Strain 19				Samples from groups vaccinated with S.19 and subsequently challenged with Strain 544	
			Vaccinated at 6 months	Vaccinated at 18 months	Vaccinated at 6 and 12 months	Vaccinated at 6, 12 and 18 months	Proved infected	Proved non-infected
Ring ...	N. 267/270 (98·9 per cent.) 3 '±'	N. 38/238 (15·9 per cent.)	N. 268/276 (97·1 per cent.) 8 '±'	N. 260/276 (94·2 per cent.) 2 '+', 14 '±'	N. 262/276 (94·9 per cent.) 1 '+', 13 '±'	N. 254/270 (94·1 per cent.) 3 '+', 13 '±'	N. 196/917 (21·4 per cent.)	N. 219/256 (85·5 per cent.)
Plate ...	N. 270/270 (100 per cent.)	N. 24/238 (10·1 per cent.)	N. 276/276 (100 per cent.)	N. 274/276 (99·3 per cent.)	N. 275/276 (99·6 per cent.)	N. 270/270 (100 per cent.)	N. 131/917 (14·3 per cent.)	N. 224/256 (87·5 per cent.)
Whey ...	N. 20/20 (100 per cent.)	N. 41/178 (23 per cent.)	N. 20/20 (100 per cent.)	N. 16/18 (88·9 per cent.)	N. 20/20 (100 per cent.)	N. 20/20 (100 per cent.)	N. 212/731 (29 per cent.)	N. 148/148 (100 per cent.)
Biological	. .	N. 79/118 (66·9 per cent.)	. .	. .	. .	. .	N. 88/408 (21·6 per cent.)	N. 302/302 (100 per cent.)

N. 267/270 signifies 267 tests negative in a total of 270. . . signifies not done.

* The method used in Great Britain is such that it gives a 50 per cent. agglutination at 1 : 480 (final dilution of serum in the serum antigen mixture) with the International Standard Anti-*Brucella abortus* serum.

ways prior to breeding age has been studied in detail and we believe that vaccination does not appear to be a hazard in the subsequent application of individual milk agglutination tests provided that samples from freshly calved cows are not included. This had been noticed already by one of us (McDiarmid, 1946) during an examination of the whey agglutinins in a small sample of cattle vaccinated with Strain 19 at 18 months of age and subsequently challenged by virulent *Br. abortus* in the first pregnancy. Even under these conditions only one cow in a group of 11 which resisted the infective dose showed agglutinins in the milk after one week *post partum*, although 10 of these animals still showed detectable agglutinins in their blood.

The correlation between our present milk agglutination tests and the known brucella status of the animals was not perfect but the plate test was by far the most accurate of the three tests for detecting infected animals. However, it is interesting to note that even this failed to detect about 10 to 14 per cent. of samples from known infected animals. This apparent inconsistency was noticed with samples from animals which might be classified as " borderline " cases, *i.e.*, positive biologically to some, but not all, the cyetic products, *e.g.*, localised infection in the udder without involvement of the uterus. We have also noticed a possible correlation between consistently negative ring tests from known infected cattle and the size and disparity of the fat globules in the milk of these animals and this will form the substance of another communication in due course. Moreover, the biological tests with guinea-pigs failed to demonstrate infection in 67 per cent. of milks from the same source. It could perhaps be argued that these so-called infected cattle had eliminated their infection prior to these tests being conducted and that the plate test was, in fact, too sensitive. This, however, was not the case since infection was detected in the milk of these animals by one or more biological tests during the 10-week observation period. In other words, provided sufficient guinea-pig tests are done, infection if present, will eventually be detected but owing to the intermittent nature of the excretion of *Br. abortus* in the milk, a single agglutination test with milk gives a far more reliable indication of the possible presence of infection than widely spaced and infrequent biological tests. It should perhaps be emphasised that these biological examinations were made with mixed milk and not with " strippings " alone.

In rare cases, agglutinins were demonstrated in low titre in the milk of cattle vaccinated just prior to breeding age, namely at 18 months, and it may be necessary, in due course, to restrict vaccination to the original calfhood method namely at four to nine months of age provided that this method is shown to confer adequate immunity for the milking life of the cow. Indiscriminate vaccination in later life would thus be avoided and this would to a large extent eliminate any possibility of error in the application of milk tests in practice. It may be concluded therefore that the ordinary method of calfhood vaccination should in no way interfere with a subsequent milk agglutination testing programme for the detection of carrier cows and in fact the two schemes should in every way be considered complementary.

Summary

(1) Using cattle of known *Br. abortus* history, the efficiency of various tests has been compared for detecting *Br. abortus* agglutinins in milk.

(2) The plate test is considered to be the most satisfactory method at present available, both with regard to accuracy and ease of application.

(3) Vaccination with Strain 19 prior to breeding age does not appear to provoke to any significant extent the appearance of agglutinins detectable by these tests.

(4) The milk agglutination tests appear to be a more reliable means of detecting carrier cows than infrequent routine biological tests of milk.

Acknowledgment.—We are indebted to the Directors of our respective Institutes, Dr. W. S. Gordon and Dr. A. W. Stableforth for their interest in this work.

References

BLAKE, G. E., MANTHEI, C. A., & GOODE, E. R. (1952). *J. Amer. Vet. Med. Assoc.* **120.** 1.
FLEISCHHAUER, G. (1937). *Berl. tierarztl. Wschr.* **53.** 527.
MCDIARMID, A. (1946). *Vet. Rec.* **58.** 146.
OGONOWSKI, K. (1952). W.H.O./Bruc/57. September.

This paper is intended to replace the preliminary publication which appeared in W.H.O./Bruc/57, September, 1952. It includes both the work then referred to and also observations made during the second pregnancy of the animals concerned.

Current Literature

REPORT

Southern Rhodesia : Annual Report of the Director of Veterinary Services for year ended September 30th, 1954.

The disease situation over much of Africa follows broadly the same pattern. In some territories, however, outstanding features occur and in the case of Southern Rhodesia for the year under review these may be summarised as trypanososomiasis, and contagious epididymitis and vaginitis. These, with foot-and-mouth disease, have been the matters of chief concern to the Veterinary department.

On the positive side there is recorded the total absence of East Coast Fever from the country since 1948. This is a great gain.

Theileriasis is, however, steadily increasing and mortality, especially among high grade stock, can be as high as 100 per cent. Treatment has little to commend it ; not only because of the generally negative results so far obtained of drug treatment, but also because recovered animals remain reservoirs of infection. Thus tick eradication by means of dipping and hand dressing remains the only effective means of control. In the absence of proper dipping tanks power sprays are becoming increasingly popular.

There was a long sustained outbreak of foot-and-mouth disease and the situation was further aggravated by the presence of three different types of virus : S.A.T. I, S.A.T. II, and S.A.T. III. No type gave any immunity against any other. As an example of this a herd of 13 cattle is quoted in which all reacted to a natural attack of Type II infection on January, 1953.

On being inoculated with Type I infection on May, 1953, eleven of the 13 reacted and then again reacted to an inoculation of Type III infection in July, 1953. In the control of this outbreak 113,618 cattle received field virus inoculation.

The detection, treatment and control of trypanosomiasis in its increasing incidence is a departmental function of high priority. As an example of the ravages of this disease, in one tsetse-infested native reserve the cattle population fell from 5,018 in 1948 to 254 in 1953 and this in spite of block treatment of all cattle at regular intervals with dimidium bromide. This treatment only resulted in a drug resistant infection. It has been found that in the presence of tsetse drug treatment is a losing struggle. A high mortality in donkeys also occurred.

Rabies continues as a constant source of anxiety. This scourge is widespread throughout Africa and its acknowledged incidence in each territory bears a close relationship to the facilities which exist for its detection.

In Southern Rhodesia 121 cases were confirmed during the year and 37,336 dogs received Fleury avianised vaccine. The results of this vaccination were not completely satisfactory although the Director of Veterinary Services attributes at least part of the failure to human failings and to difficulties of transport and storage.

It is known that 60 vaccinated dogs subsequently contracted the disease : 26 more than six months after vaccination, 24 in less than six months and 10 indefinite.

Contagious epididymitis and vaginitis is recognised by the Director as one of the most important diseases affecting cattle in the Colony. Research into this condition has established that transmission can occur in the absence of a bull and outbreaks of vaginitis with pus, apparently typical of contagious vaginitis, have occurred in virgin heifers. Instances have occurred also of apparently normal bulls transmitting infection, and as a prerequisite of eradication of infection from a herd it is laid down that in all cases the bull must go. Transmission of infection in the absence of a bull may, it is thought, indicate the presence of an insect vector and experiments are in progress to determine this point. It is becoming obvious, too, that not every case of infection shows the typical symptoms of vaginitis with pus and in the absence of these symptoms it is going to be extremely difficult to declare cystic fallopian tubes and ovaries diagnostic of the disease. Cysts typical of vaginitis infection have been found in clean animals.

It has been found also that lesions of the disease can appear and disappear at intervals and that at least two clear speculum examinations are necessary before a herd can be declared free.

Animals can remain infected for at least two to three years. There is some evidence that there are two or three different strains of virus.

Of all the treatments that have been tried for this infection only aureomycin proved successful. It was given *per vaginum* both in the form of *obletts* containing 0·5 mg. and soluble tablets containing 50 mg.

In this report Mr. J. S. Adamson, Director of Veterinary Services, has given a résumé of the work of the Department as a whole, while Mr. J. Mackinnon, Assistant Director of Veterinary Services (Field), and Mr. D. S. Lawrence, Assistant Director of Veterinary Services (Research) have each given in more detail the work of his respective section of the Department.

It appears to be the policy of the Department to concern itself only with the problem of disease control and the varied nature of this problem in Southern Rhodesia and the energetic and successful way in which it has been and is being tackled is ample justification for, and full vindication of, this policy.

W.W.H.

ACCESSIONS TO THE R.C.V.S. LIBRARY

The following publications have been received in the library during the last week.

CANADA. National Research Council. Thirty-seventh annual report, 1953-54.

JAMAICA. Department of Agriculture. Annual report for the year ended December 31st, 1952. 1954.

UGANDA PROTECTORATE. Department of Veterinary Services and Animal Industry. Annual report for the year ended December 31st, 1953. 1954.

WINTERS, L. M. Animal Breeding. *Fifth edition*. New York, Wiley, 1954.

A collection of 58 theses from the Ecole Nationale Vétérinaire d'Alfort.

HONOUR FOR LIVERPOOL SCIENTIST

We note with interest that the degree of Doctor of Veterinary Science of the University of Liverpool has been conferred on Mr. K. Unsworth. We understand that this is only the fourth occasion on which this degree has been awarded, the other holders being the late Dr. J. T. Share-Jones, Dr. E. L. Taylor, and Dr. G. O. Davies. Dr. Unsworth, who is a parasitologist, took his first degree in Liverpool in 1942. After serving for several years in the Liverpool School of Tropical Medicine he joined the Colonial Service and has spent the greater part of his professional career in Nigeria.

THE CENTRAL DIVISION

In view of the importance of canine dentistry in small-animal practice especial interest attaches to the paper "A Dentist looks at the Veterinarian," which is to be delivered by Mr. Robert Cutler, M.R.C.S., L.R.C.P., L.D.S., R.C.S., at the General Meeting of the Central Division of the Association, on December 2nd. The President of the Division, Miss Freak, will take the chair at 6 p.m., and the opener of the discussion which will follow the paper will be Mr. P. L. Builder, of Paignton.

The meeting is to take place at the Royal Veterinary College by courtesy of Professor McCunn, the Acting Dean.

News and Comment

A NEW PRESIDENTIAL CHAIN

At the meeting of the Central Veterinary Society held on October 7th, Professor G. H. Wooldridge, invested the President, Miss Marion Freak, with a new Presidential Chain.

In his address Professor Wooldridge said that the new chain had come about through the personality of Professor McCunn, Treasurer of the Society, who kept a tight curb on the finances. It was a pleasant surprise to know that he was prepared to foot the bill by means of the Society's funds for most of the cost of the chain! He took care, however, to relieve the funds of a considerable amount by asking various past-presidents, whose names were likely to be inscribed on the chain to assist in the payment. He thought he ought to mention the origin of the medallion; it was presented by Mr. L. Balls, who as

president at that time thought the president should wear some distinctive emblem of office. Professor McCunn thought it would be more fitting if the president wore something a little better than mere ribbon; hence the idea of the chain of office. The Society was an old one and if all the names of the past-presidents were inscribed on the separate parts they would need a chain of office as long as the surcingle of a horse. It was decided to go back to the time when the medallion was presented; he rather resented that as he was president for three years and there was no indication that he was ever a member of the Society! He thought they should go a step further and have the names of all past-presidents engraved on the other side, as there was no record of such marvellous presidents as McGee, William Hunting, Lionel Stroude and others. There was no record on the chain that they were ever associated with the Society. It was a pleasure to invest the President with the chain of office and it was nice to know that Miss Freak was the first President to wear it.

In her reply Miss Freak said on behalf of members of the Society that she wished to express thanks for the presentation and particularly sincere thanks to the past-presidents whose generosity had made it possible.

R.C.V.S. EXAMINATIONS

List of Successful Candidates

Pharmacology, November, 1954

Dublin : Dargan, P., Devereux, W. R., Hernon, J., Kilroy, G. S. M., McDonald, W. E., O'Neill, J. J.

London : Baker, K. P., Barnett, K. C., Blackmore, D. K., Bruford, J. C., Butler, B. C., Chappell, L. A., Clark-Lewis, A. V., Cook, W. E. R., Davies, Miss G. M,. Edgar, R. K., Giles, H. G., Gill, E. A., Girling, Miss M. J., Greenwood, R., Hime, J. M., Hollands, J. G., Jones, C. R. V., Lawrence, B. T., Mason, J. A., Mullen, P. A., Nelson, E. P., Newey, R. M., Oke, M. A., Prasad, A. K., Teale, M. L., Volrath, J. P., Wells, B .T.

Animal Management, November, 1954

Dublin : Boyce, W. T. M., Leslie, N. W., Lyons, V.

Edinburgh : Gee, B. D.

R.C.V.S. ACKNOWLEDGMENT

The Royal College of Veterinary Surgeons acknowledges with thanks the receipt of the sum of 10s. sent anonymously from Leicester for any fund of the College " for kindness received."

MINISTRY OF AGRICULTURE, VETERINARY FIELD STAFF

Mr. R. H. Ewart, M.R.C.V.S., Veterinary Officer at Carlisle has been transferred to Stirling on temporary promotion to the rank of Divisional Veterinary Officer, and Mr. M. Herlihy, M.R.C.V.S., Veterinary Officer at Hertford, has also been transferred to Head Office on temporary promotion to the rank of Divisional Veterinary Officer.

Mr. W. B. Milburn, B.SC., M.R.C.V.S., Veterinary Officer has been transferred from Truro to Carlisle.

The Ministry's Divisional Office at Sleaford has been moved to Animal Health Division, Government Buildings, Grantham Road, Sleaford (Tel. Sleaford 317).

PAPERS OUTSTANDING

The next four issues of THE RECORD will contain, as their scientific content, the Congress papers and discussions. We regret, therefore, that a number of other papers, accepted for publication, are temporarily held over, and we trust this will not be unduly inconvenient to the authors.

COMING EVENTS

Dec. 1st.—Meeting of the Lancashire Division, B.V.A., in the Veterinary Hospital, Pembroke Gardens, Liverpool, 2.30 p.m.

Dec. 2nd.—General Meeting of the Central Division, B.V.A., at the Royal Veterinary College, Camden Town, London, N.W.1, 6 p.m.

Dec. 3rd.—General Meeting of the Midland Counties Division, B.V.A., at the Ministry of Agriculture, Woodthorne, Wergs Road, Tettenhall, Wolverhampton, 2.30 p.m.

Dec. 3rd.—Annual Dinner and Dance of the North Wales Division, B.V.A., in the Imperial Hotel, Llandudno, 7 p.m.

Dec. 8th.—Ordinary General Meeting of the Sussex Division, B.V.A., at the Old Ship Hotel, Brighton, 2.30 p.m.

Dec. 8th.—Meeting of the Technical Development Committee, at 7, Mansfield Street, Portland Place, W.1., 10.30 a.m.

Dec. 9th.—General Meeting of the East Midlands Division, B.V.A., at the School of Agriculture, Sutton Bonington, 2.15 p.m.

Dec. 15th.—Meeting of the Section of Comparative Medicine, the Royal Society of Medicine, at 1, Wimpole Street, London, W. 1, 5 p.m.

Dec. 30th.—Annual Dance of the Ladies' Guild, Dumfries and Galloway Branch of the V.V.B.F., in the Cairndale Hotel, Dumfries.

PERSONAL

Births

ANDREW.—On November 3rd, 1954, at Grosvenor Nursing Home, to Sheila Frances (*née* Bateman), wife of Angus S. Andrew, M.R.C.V.S., 251, Wellington Road, North Heaton Chapel, Stockport, Cheshire, a son—Ian Sinclair.

GITTINS.—On November 14th, 1954, at Ripon Maternity Hospital, to Sheena (*née* Skinner), wife of John M. Gittins, B.SC., M.R.C.V.S., of Clifton House, Leyburn, Yorkshire—a son.

SPARROW.—On November 5th, 1954, to Angela (*née* Keesey), wife of Barton Sparrow, M.R.C.V.S., of 47, York Gardens, Braintree, Essex, a son—Hugh Charles Gregory.

WOODALL.—On November 12th, 1954, at St. Mary's Hospital, Portsmouth, to Barbara, wife of Harold Woodall, M.R.C.V.S., of Pine Cottage, Hill Brow, Liss, Hants, a daughter—Susan Melanie.

R.C.V.S. OBITUARY

FORD.—Leslie Josiah, of Leylands Farm, Fishers Pond, Eastleigh, Hants. Graduated London, July 13th, 1923; died suddenly on Friday, November 19th, 1954, whilst on holiday in Portugal.

GRESHAM.—Francis Baker (Major, late R.A.V.C. (T.A.)), 209, London Road, Balderton, Newark-on-Trent, Notts. Graduated London, July 17th, 1897; died November 16th, 1954, aged 81 years.

HOGGAN.—Thomas, R. R. (V.D., Major C.A.V.C., retd.), of Langley Prairie, B.C., Canada. Graduated Edinburgh, May 28th, 1892; died September 10th, 1953. Major Hoggan was elected an Honorary Member of the British Columbia Veterinary Association in 1950 in recognition of his long service to the Association.

ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Anthrax:

Ches. Dairy Farm, Ledsham, Wirral (Nov. 13); Claim Farm, Manley, Warrington; Woodhouse Farm, Holmes Chapel, Crewe (Nov. 16).

Denbighs. Rackery Hall Farm, Llay, Wrexham (Nov. 15); Rodens Hall, Bowling Bank, Wrexham (Nov. 18).

Glouc.s. Cosy Farm, Huntingsford, Charfield (Nov. 15).

Lancs. Park House Farm, Bay Horse, Lancaster; Manor Farm, Singleton, Blackpool (Nov. 15).

Leics. Charnwood, Leicester Road, Narborough (Nov. 12); Broadacres, Lutterworth Road, Blaby (Nov. 16).

Northumberland. White Hills Farm, Sparty Lea, Allendale (Nov. 13).

Salop. Plas yn Coed, Dudleston, Ellesmere (Nov. 15).

Staffs. Aspley Farm, Standeford, Coven, Wolverhampton (Nov. 15).

Yorks. Myers Farm, Wensley, Leyburn (Nov. 13).

Fowl Pest:

Bedford. 28, Plummers Lane, Haynes, Bedford (Nov. 18).

Devon. Little Venhay, Meshaw, South Molton (Nov. 16).

Essex. New House Farm, Apton Fields, and Apton Fields Bungalow, Barnston, Dunmow (Nov. 13).

Hunts. 1, Church Lane, Hemingford Grey, Huntingdon (Nov. 17).

Lancs. 3, Hareshill Road, Birch, Heywood (Nov. 16).

Lincs. 64, Eastwood Road, Boston; Great Limber, Grimsby (Nov. 13); 14, Wheelbridge, Wainfleet St. Mary; Westfield House, Stallingborough Road, Healing, Grimsby; Eastwood Road, Fishtoft, Boston; 15-16, Wheelbridge, Wainfleet St. Mary (Nov. 16); Stallingborough Road, Healing, and Bungalow, Wells Road, Healing, Grimsby (Nov. 17).

Norfolk. North View Farm, Mattishall, E. Dereham (Nov. 13); White House, Garveston, Norwich (Nov. 14); The Elms, Welborne Road, Mattishall, E. Dereham; White Mill Poultry Farm, Beetley, Dereham (Nov. 15); Bracken Brae, Green Lane, Beetley, East Dereham; Hill House, Yaxham; Wood Farm, Bawdeswell, E. Dereham; Front Street, Salhouse, Norwich; Willow Farm, Badley Moor; Post Office, Mattishall, and Mill Street, Mattis-

hall (Nov. 16); Paper Street, Yaxham, Dereham (Nov. 18).

Sussex. 2, Manor Farm Cottages, Eastergate, Chichester (Nov. 16).

Swine Fever:

Bedford. Green Acres, Potton Road, Biggleswade, (Nov. 16).

Cambs. Hundred Acre Farm, Harrold Bridge, Gorefield, Wisbech (Nov. 18).

Ches. Gascott Farm, Church Lane, Neston, Wirral (Nov. 16).

Devon. Telbridge Farm, Roborough, Winkleigh (Nov. 16).

Dorset. Ilkley Moor Farm, Potterne, Three Cross, Nr. Wimborne (Nov. 20).

Essex. 24, Crow Lane, Romford (Nov. 16); Valley Farm, Valley Road, Braintree (Nov. 19).

Hunts. Mere Farm, Forty Foot, Ramsey (Nov. 17).

Lancs. Crosby Hall Farm, Little Crosby, Liverpool, 23; Wood Top Farm, Goosnargh, Preston (Nov. 15); Fletcher Farm, Tottington, Bury (Nov. 16); Katoomba. Bells Lane, Lydiate, Maghull, Liverpool (Nov. 17).

Lincs. Ashdene, Branston; High Street, Waddington, Lincoln; 6, Northlands Road, Winterton, Scunthorpe; Stutehouse Farm, Messingham, Scunthorpe (Nov. 15); Ryland Road, Welton, Lincoln; Low Church Road, Middle Rasen, Market Rasen (Nov. 20).

Norfolk. Mill House, Station Road, North Elmham, Dereham (Nov. 17); West End Farm, Hickling, Norwich (Nov. 18).

Notts. Lodge Farm, Thorney, Newark (Nov. 19).

Salop. Villa Farm, Ryton, Dorrington, Shrewsbury (Nov. 18).

Staffs. No. 1 and No. 2 Smallholding, Mill Lane, Bilbrook, Wolverhampton; Warley's Wharf, off Carisbrooke Road, Friar Park, West Bromwich (Nov. 15).

Suffolk. Eglantine Farm, Withersfield Road, Haverhill (Nov. 19).

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

CHRISTMAS APPEAL

Sir,—It is customary at this time of the year to appeal through your columns for donations which will assist us in sending Christmas gifts to all the recipients of the Victoria Veterinary Benevolent Fund.

May we, therefore, express the hope that members will kindly send a donation, however small, to the Secretary, V.V.B.F., 10, Red Lion Square, London, W.C.1., marked " Christmas Gift."

H. W. DAWES, President,
J. McCUNN, Hon. Treasurer,
J. J. DUNLOP, Hon. Secretary,

10, Red Lion Square,
London, W.C.1.
November 11th, 1954.

LABORATORY ASSISTANCE

Sir,—It is apparently becoming more difficult to obtain laboratory assistance and advice on small-animal problems.

This is a serious blow to anyone wishing to offer a relatively good standard of service to clients, who are daily becoming more conscious of the scientific status of our profession, and therefore, are expecting that such resources are made available to us.

It is frustrating in the extreme to know that one should have confirmatory evidence before adopting a particular line of therapy and yet know that one is unable to obtain that confirmation.

How can our knowledge of the small-animal diseases be advanced if there is not a better liaison between the laboratory and the practitioner? And if, perchance, I am wrong in my surmise and in fact this liaison does, somewhere, exist, I should be grateful for the information.

Yours faithfully,

T. L. KENNEA,

23, Gerston Road,
Paignton, Devon.

SOME REFLECTIONS ON THE MASTITIS PROBLEM

Sir,—I am indebted to Professor Francis (*Vet. Rec*. October 30th) for drawing the attention of your readers to the very interesting and useful article published by Berger & Francis (1951). On re-reading this article I see that I was clearly in error in making the suggestion that my survey, as outlined in a talk I gave to the Sussex Veterinary Division under the above heading was the first of this type, and that a survey based on every clinical case seen in one practice was in fact undertaken over the years 1945-47 by the above authors. This omission was an oversight on my part because I was familiar with Berger & Francis' paper. Arthur (1947) undertook a survey on somewhat similar lines, although his facts were obtained from all the clinical cases in only four herds over the period 1941-46.

It will be clear that the findings of Arthur's survey are not necessarily a true reflection of what might take place in any one veterinary practice, and of course, both surveys took place before the widespread use of penicillin and other antibiotics which may have since influenced the mastitis picture.

It will be appreciated that a talk and discussion in a divisional society is not necessarily a suitable place for an exhaustive review of the literature, and I am conscious that my paper suffered from many omissions on this score, if not on others.

Nevertheless, I am glad of the opportunity to acknowledge these two previous and excellent surveys.

Yours faithfully,

D. L. HUGHES,

References

ARTHUR, G. H. (1947). *Vet. Rec*. **59.** 231.
BERGER, J. & FRANCIS, J. (1951). *Ibid*. **63.** 283.

A LEGITIMATE GRIEVANCE

Sir,—The legitimate grievance of Ms.R.C.V.S., and S.V.R's. in private practice is the injury they suffer from the advertising of veterinary services by certain animal welfare societies, health trusts, drug firms and the Ministry of Agriculture and Fisheries. Between them these four groups of institutions advertise services to all animals, from racehorses to poultry and fur-bearing animals. In order to conduct, or to cover the conduct of, such services these four groups of institutions employ Ms.R.C.V.S. and/or S.V.R's., whole-time or part-time.

For more than 100 years all Ms.R.C.V.S. have imposed upon themselves a Code of Conduct, the administration of which they have annually entrusted to the Council R.C.V.S. For more than 100 years the Council R.C.V.S. has rightly and properly penalised members in private practice for advertising. Advertising beyond the limits precribed by the by-laws R.C.V.S. is a breach of the code, in that it is injurious to fellow members. But the Council seem to be powerless or unwilling to penalise members who are employed by institutions which offend against the code.

To excuse the veterinary surgeon employee as not responsible for the offences perpetrated by his non-veterinary surgeon employer is the *via negativa*. It seems to me that the positive way of approach is for the R.C.V.S. to insist that veterinary practice shall be clean and honourable; and that, as a consequence, no M.R.C.V.S. or S.V.R. shall be permitted to practice to the hurt of his fellows. What the Council should sit in judgment upon is the act; is the particular act complained of injurious or not? If the act is shown to be injurious the Council should condemn it; and, if necessary, should inflict punishment upon the. employer institution by removing its veterinary employees from the Register.

Yours faithfully,

529a, Finchley Road, TOM HARE,
London, N.W.3.

November 15th, 1954.

Sir,—What is required is legislation to enforce every charitable organisation to publish not only details regarding its income, but to give the greatest detail as regards total expenditure—this to include every penny paid out in salaries (no matter how handsome they are) to everyone employed from top to bottom, *i.e.* from the Secretary or organiser to the most menial kennel-maid, as well as all other outgoings. Many of these charitable organisations are, fortunately, not permitted to make profits, nor are their members entitled to any share of assets, and this is stated clearly in their Memoranda of Association. If such a balance sheet were prepared how much easier it would be for the charitably disposed to see how their subscriptions were spent. In the case of some animal clinics is it common knowledge that sick and injured animals are, in most cases, not treated by fully qualified registered veterinary surgeons?

Yours faithfully,

THOMAS LISHMAN,
Barrister-at-Law.

23, Queen's Gate Gardens,
London, S.W.7. *November 22nd*, 1954.

A LEGITIMATE SOLUTION IN 1858

Sir,—In May, 1858, there took place the 14th annual meeting of the members of The Royal College of Veterinary Surgeons. The President, James Turner, occupied the chair, supported by some of the most eminent members of the profession of whom there was a full attendance.

In the course of this meeting the President made reference to the existence of a great obstacle to the success of veterinary surgeons, by which the remuneration of the profession was much interfered with. Mr. Turner thought that this was owing to the fact that the public did not know who were the real veterinary surgeons and who were not.

The President suggested a possible solution. He had made enquiries and found that the *Morning Post* would publish the names and addresses of 1,000 qualified veterinary surgeons for about six guineas, or they might get a page of *The Times* at the small expense of an annual amount of about two shillings and sixpence each member.

Grievances remain though means of solution change; yet it is evident that something must be done to protect the small-animal practitioner and to remedy what is as legitimate a grievance as was that of nearly 100 years ago.

Yours faithfully,

J. W. BARBER-LOMAX,

Garsdale,
Calrews,
Bury, Lancs.

November, 1954.

ODE

Sir,—

For years and years a hirsute man
Who was the pious founder,
Gazed out at us with bearded pan
And none than him was sounder.

Then in a trice one summer's day
Outwith members awareness,
'Twas planned to take the face away
And leave an empty, bareness.

The plan succeeded quick as light
Amid great consternation,
The ' Record ' issued deadly white,
The founder—no relation!

Old members fume and letters flow
Hot controversy rages,
Should Hunting stay or Hunting go
From time-worn ' Record ' pages?

Both cash and conscience are drawn in
To prove that it's sedition,
And many are the pleas to win
Return to next edition.

But there are some who soon agree
Despite traditional ties,
It's as important now to see
Editorial enterprise.

So let us welcome covers red,
Magenta or pale pink,
Splash headings we can read in bed
And stuff to make us think.

Go on, good sir, fulfil your task,
Progress must have its way,
A worthy Journal's what we ask,
This price we gladly pay.

Yours faithfully,

D. D. OGILVIE,

Sale,
Cheshire.

November 16th, 1954.

LAPINISED RINDERPEST VIRUS

Sir,—The abridged version (1954) of J. R. Hudson's contribution to the symposium "Modern Trends in Veterinary Therapeutics" contained a statement which cannot be passed without comment. He is reported as saying: "Cattle of resistant breeds will not always react to lapinised virus proved viable by inoculation to more susceptible animals. Yet these animals may die later if exposed to a more virulent strain of greater attacking power." Either Mr. Hudson has been misreported or he has changed his published views on rinderpest immunisation.

The implication that a reaction, following the inoculation of lapinised rinderpest virus, is an index of efficient immunisation is acceptable but with the important qualification that the reaction may not be clinically detectable in individual animals (Scott, 1954). I am unaware of any controlled experiments demonstrating the breakdown, by virulent virus, of an immunity engendered by lapinised virus. In fact, duration of immunity experiments are based on the assumption that a reaction following challenge with virulent virus indicates that the animal was no longer immune. Similarly, there is no evidence that the vaccine strains of lapinised virus will not immunise following multiplication within the animal. Like other viruses, the same sample of lapinised rinderpest virus will have different titres in hosts of differing natural resistance and the demonstration of viable virus in one type of host is not a criterion that the same dose will infect another type of host. Hence the necessity for testing batches of rinderpest vaccine in cattle similar to those in which the vaccine will be used in the field.

I apologise to Mr. Hudson for criticising two sentences out of context, more especially as I fully agree with the sentiments of the paragraph which stressed the danger of going too far in decreasing the virulence of virus strains used as immunising agents.

Yours faithfully,

GORDON R. SCOTT,

Veterinary Research Laboratory,
Kabete,
Kenya.

November, 1954.

References

HUDSON, J. R. (1954). *Vet. Rec.* **66.** 542.
SCOTT, G. R. (1954). *Nature.* **174.**

WILLIAM HUNTING

Sir,—I am sorry to have to return to the attack. Why or at whose instigation and advice was our old friend's picture removed from its revered place on our RECORD? Was someone jealous of the fact that he was able to grow a very handsome beard? Many of our leading lights and very capable operators wore them, including the elder W. Williams, who founded the New Veterinary College, Edinburgh, and Sir F. Hobday, to mention but two.

As a very small boy I can only just remember Williams; as a student Hobday, and as a graduate Hunting, who examined me in my final and whom all students thought most kind and considerate, he certainly gave them a fair crack of the whip. He, like another great man (though clean-shaven) of our day, loved a good cigar. I hope this fact, like his manly hirsute appendage, will not be held against him. He stamped out that filthy disease glanders, and his efforts therein was an outstanding example of what our profession could, and might yet do, in the stamping out of diseases if they were left to us to deal with.

I think I am correct when I state that Williams demonstrated the fact that Texas fever was carried by the tick, and we surely have not yet forgotten Hobday.

Yours faithfully,

H. S. ELPHICK.

36, Woodvale Road,
Darlington.

November 15th, 1954.

DISEASES OF ANIMALS ACT, 1950—GREAT BRITAIN

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period		Anthrax	Atrophic Rhinitis	Foot-and-mouth	Fowl Pest	Sheep Scab	Swine Fever
16th to 31st October, 1954		20	—	—	15	—	43
Corresponding period in	1953	9	—	1	37	—	84
	1952	104	—	—	19	—	20
	1951	7	—	—	43	—	97
1st January to 31st October, 1954 ...		257	4	12	630	—	1,245
Corresponding period in	1953	528	—	29	790	—	2,436
	1952	842	—	494	199	1	743
	1951	339	—	28	653	5	1,122

TUBERCULOSIS (ATTESTED HERDS) SCHEMES

The number of Attested Herds, i.e., herds officially certified as free from Tuberculosis as at October 31st, 1954, was as follows :—

ENGLAND	WALES	SCOTLAND	TOTAL (GREAT BRITAIN)
64,280	31,644	32,466	128,390